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| 10/065,929  | 12/02/2002  | John J. Heine        | 1372.66.PRC         | 6456             |
| 21901   | 7590        | 06/06/2008           |                     |                  |
| SMITH HOPEN, PA<br>180 PINE AVENUE NORTH<br>OLDSMAR, FL 34677 |             |                      |                     |                  |
| EXAMINER  |             |                      |                     |                  |
| LIN, JERRY  |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/065,929

**Applicant(s)**

HEINE ET AL.

**Examiner**

JERRY LIN

**Art Unit**

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**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

### **DETAILED ACTION**

1. Applicants' arguments and amendments, filed March 20, 2008, have been fully considered and they are deemed to be persuasive in-part. The following rejections are reiterated. They constitute the complete set presently being applied to the instant application.

### ***Status of the Claims***

Claims 1-7 and 9-14 are under examination.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-5, 9, 10, 12, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger et al. (US 5,133,020) in view of Huo et al. (US 6,282,305).

The instant claims are drawn to a method of screening mammograms to identify abnormalities by establishing the breast cancer risk probability value associated with an asymptomatic patient, selecting a computer algorithm to find abnormalities, determining a threshold for identifying false positives, and adjusting the threshold in response to the risk probability value, and applying the computer algorithm using the adjusted standard threshold to identify abnormalities in the patient's mammogram.

Regarding claims 1, 13 and 14, Giger et al. teach identifying a standard threshold of a computer algorithm for identifying false positive abnormalities in mammograms that is independent of the array of risk factors (column 6, lines 33-column 9, line 10); and adjusting the threshold for identifying false positives based on the risk associated with an asymptomatic patient (column 1, line 63- column 2, line 30; column 12, line 58-column 13, line 7). Furthermore, Giger et al. teach electronically displaying their results as an image (page 13, lines 19-57; Figures 8, 13, 15, and 18).

However, Giger et al. do not specifically teach calculating breast cancer risk.

Huo et al. disclose a method which includes establishing a breast cancer risk probability with a patient with factors such as age wherein the risk probability is between

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0 and 1 (column 5, lines 55-63; column 6, line 25-40); applying (selecting) a computer algorithm to find abnormalities in a patient's mammogram (column 9, lines 30-48).

Regarding claims 2 - 4, Huo et al. also discuss relative risk and absolute risk (column 3, lines 25-40) as well as include specific odds ratios in regard to breast cancer (column 3, line 66 - column 4, line 5).

Regarding claim 5, Huo et al. disclose determining parenchymal patterns (breast tissue density) (column 8, line 61-column 9, line 7; column 7, lines 18-37); integrating breast tissue density in the risk probability value (column 8, line 61-column 9, line 7; Figure 10).

Regarding claim 9, Huo et al. also disclose a data entry interface (Figure 13; column 29, lines 10-61); digitally acquiring the patient's mammogram (column 37, claim 45; column 29, lines 10-61); applying the algorithm to the mammogram (column 37, claim 45; column 29, lines 10-61).

Regarding claim 10, Huo et al. disclose storing risk factors on electronic storage medium with digitally acquire mammogram (column 37, claim 45 – column 38, claim 48; column 29, lines 10-61).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to combine the references of Huo et al. with Giger et al. to gain the benefit of using known risk analysis methods to improve the prognosis or diagnosis of breast cancer based on mammograms. Giger et al. indicate that the threshold may be adjusted for the risk assessment of a patient for better evaluation of a mammogram (column 12, line 58-column 13, line 7). Based on their recommendation, one of ordinary

skill in the art would have been motivated to search for a method of calculating breast cancer risk. Huo et al. provide methods of calculating breast cancer risk as well as well-known electronic means of entering and processing risk. One of ordinary skill in the art would have been motivated to combine the references of Giger et al. and Huo et al. in order to carry out Giger et al.'s method as he indicates.

#### Response to Arguments

4. The Applicants have responded to this rejection by stating that Giger et al. do not teach a standard threshold that is independent of the array of risk factors associated with the asymptomatic patient. The Examiner disagrees. Giger et al. teaches creating a threshold by comparing images of mammograms (column 6, lines 33-column 9, line 10). This threshold is used to determine false positive abnormalities (column 6, lines 33-column 9, line 10). Furthermore, the threshold is initially calculated on the basis of the images, not the risk factors, thus the threshold is independent of an array of risk factors at this stage. Thus the Giger et al. teaches the instant limitation.

5. Claims 6, 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger et al. (US 5,133,020) in view of Huo et al. (US 6,282,305) as applied to claims 1-5, 9, 10, 12, 13 and 14 above, and further in view of Wang (US 6,266,435).

The instant claims are drawn to a method of screening mammograms to identify abnormalities by establishing the risk probability value associated with an asymptomatic patient, selecting a computer algorithm to find abnormalities, determining a threshold for

identifying false positives, and adjusting the threshold in response to the risk probability value, and applying the computer algorithm using the adjusted standard threshold to identify abnormalities in the asymptomatic patient's mammogram. The algorithm also includes flagging mammograms (claims 6 and 7) or recommending a course of action (claim 8).

Giger et al. and Huo et al. are applied as above.

Neither Giger et al. or Huo et al. teaches flagging mammograms.

Regarding claims 6 and 7, Wang discloses flagging (marking or annotating) positive or negative results of mammograms where the positive results may require further analysis (assessment) (column 8, lines 47-65).

Regarding claim 11, Wang discloses presenting the results with computer aided enhancement (column 7, lines 37-56).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to combine the references of Huo et al. and Giger et al. with Wang to gain the benefit of electronically annotating the mammogram images. Wang discloses that his method offers the advantage of providing to a physician or technician additional information to aid in the interpretation of the mammogram image as well as to aid in the determination of the best course of action for a patient (Wang, column 4, lines 1-16). Huo et al. and Giger et al. both disclose methods of interpreting digital mammogram images to aid physicians. Thus, one of ordinary skill in the art would have been motivated to combine the methods of Huo et al., Giger et al., and Wang to provide a complete set of tools to aid a physician in interpreting mammograms.

Response to Arguments

6. The Applicants have responded to this rejection by stating that Giger et al. does not teach a standard threshold as recited in the claims. Please see above for the Examiner's response.

***Withdrawn Rejections***

7. Applicant's arguments and amendments, filed March 20, 2008, with respect to the rejections made under 35 U.S.C. §§112 and 101 have been fully considered and are persuasive. The amendments are sufficient to overcome rejections made under 35 U.S.C. §§112 and 101. These rejections have been withdrawn.

***Conclusion***

No claim is allowed.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY LIN whose telephone number is (571)272-2561. The examiner can normally be reached on 7:00-5:30pm, M-TH.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie A. Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. L./  
Examiner, Art Unit 1631  
6/3/08

/Marjorie Moran/  
Supervisory Patent Examiner, Art Unit 1631

